REMARKS

Claims 1-19 are pending in this application. Attached hereto is a complete listing of all claims in the application, with their current status listed parenthetically. By this Response, new claim 20 has been added, and claims 1, 9 and 14 have been amended.

Applicant acknowledges with appreciation the courtesies extended by the Examiner to Applicant's representative in the telephonic interview conducted August 26, 2004. In the interview, the bases for the rejection of the instant application under 35 U.S.C. § 103(a) were discussed. While no binding agreement was reached, the Examiner agreed that the amendment to each of claims 1, 9 and 14 further distinguished the invention from the Fullerton reference (U.S. patent 5,687,169).

Specifically, the amendment to each of claims 1, 9 and 14 more clearly emphasizes that a multiplicity of ultra wide band pulses are sent using a TDMA frame format. That is, communication in the ultra wide band network of the present invention is accomplished by transmission of TDMA frames, with each frame comprising literally thousands of ultra wide band pulses.

In contrast, Fullerton teaches "pulse interleaving" and "burst interleaving" methods, which are used to provide a "lock" between two transceivers. Pulse interleaving is described in Fullerton's section III: Full Duplex for Impulse Radio Communications Systems (column 9, line 45 to column 13, line 47). In this section, Fullerton describes "a pulse interleaving technique" that avoids "contention zones" where pulses from both transceivers would "pass exactly on top of each other", thus causing interference (col . 10, lines 4-19):

> "The easiest way to resolve these contention zones 1206 is to permit the first transceiver to have a choice of say, 10 ns or 100 ns of delay before transmitting after receiving a pulse. This removes the interference at point 1208 for example, by pushing (position in time) pulse 1210 up to point 1212 so that the self-interference is avoided." (col. 10, lines 32-37, with reference to FIG. 12)

Thus, Fullerton teaches transmission of ultra-wideband pulses between two transceivers where the pulses are interleaved so as to avoid interference. With reference to FIG. 13, Fullerton teaches the steps required for signal acquisition (or "lock") using pulse interleaving (col. 10, lines 43-64).

Then, with reference to FIG. 14, Fullerton teaches "burst interleaving," which is used to overcome the "unique contention zone problems" of a mobile environment (col. 11, lines 10-14). A burst "contains 20 pulses at a 2 megapulse per second rate, or 50 pulses at a 5 megapulse rate" (this translates to one pulse every 20 nanoseconds for either the 20 or 50 pulse bursts).

In the "burst interleave method" illustrated in FIG. 14, the transmitter (containing T1 and R1, see FIG. 9) sends a burst of 20-50 pulses. The receiver (containing T2 and R2) scans, acquires a lock then transmits a burst back to the transmitter. Then the transmitter and receiver both transmit and receive acquisition messages using bursts having 20-50 pulses, establishing a "lock" between them.

So, using the burst interleave method, groups of 20-50 pulses are used to obtain a "lock" between two mobile transceivers. Obtaining a "lock" is not TDMA communication using a multiplicity of ultra wide band pulses as recited in Applicant's independent claims.

In addition, Fullerton can only "find" a pulse within a 200 nanosecond time period. This is discussed in col. 13, beginning at line 13: The Impact of the Width of the Dither Window on System Performance. "The dither window is the period within which a monocycle (a pulse) can occur as positioned by a dither code" (col. 13, line 15-16). The dither window is 5 nanoseconds wide, and each window is separated by 200 nanoseconds: "a subsequent monocycle can occur anywhere within the next dither window, and at a minimum, 200 nanoseconds later (emphasis added, col. 13, lines 18-20).

Thus, Fullerton is incapable of distinguishing pulses on a 20 nanosecond time period. But each pulse in the 20 or 50 burst group is 20 nanoseconds apart (20 pulses at 2 megapulses per second, or 50 pulses at 5 megapulses per second). **It would take ten 20 nanosecond pulses to occupy a 200 nanosecond time period, which would then be seen by the receiver as a only a single pulse. Therefore, a "burst" of pulses are sent so that a receiver has a better chance of detecting at least one! Again, this is not TDMA.**

Furthermore, as stated by Fullerton: "In the pulse interleave, burst interleave, CDMA and the repetition rate multiple access techniques, the distinction between all these types of interleaves disappears at the full frame. They are indistinguishable from one another" (emphasis added, col. 13, lines 40-43). A "frame" as defined by Fullerton is "the nominal interpulse interval" (col. 13, line 22). Put another way, Fullerton cannot tell the difference between these methods at the pulse-to-pulse level. Therefore, burst and pulse interleaving are just two methods for achieving "lock" - - with bursts used for the more difficult mobile environment.

Simply put, in pulse interleaving one-pulse-at-a-time is sent back-and-forth between two transceivers to establish a "lock." In burst interleaving, a group of pulses are sent back and forth to establish a lock between two mobile transceivers. Neither of these methods teach or suggest using a TDMA frame format by transmitting a multiplicity of ultra wide band pulses. In fact, Fullerton teaches away from TDMA communications in ultra wide band systems:

> "Full duplex operation has traditionally been accomplished by either frequency domain or a time domain multiple access (FDMA or TDMA) . . . Because of the ultrawide-band characteristics of impulse radio, it is difficult to modify impulse radio systems to use conventional duplex schemes" (col. 1, lines 19-21 and 40-42).

In view of the above discussion, Applicant respectfully submits that the Section 103 rejection of claims 1, 9 and 14 has been traversed. Applicant's analysis of the two secondary references, Hodzic and Hulyalkar were presented in the Response to Office Action mailed

February 11, 2004. Because claims 2-8, 10-13 and 15-19 depend from either claim 1, 9 or 14, it is respectfully submitted that the rejection of claims 2-8, 10-13 and 15-19 have been traversed by virtue of their dependency from either claim 1, 9 or 14. M.P.E.P. § 2143.03.

Rejection Under 35 U.S.C. § 101

In paragraph 1 of the Office Action, pending claims 14-16 and 19 stand rejected under 35 U.S.C. §101 as being unpatentable. Specifically, the Examiner states "Claim 14 discloses a series of manual steps and does not clearly disclose of implementing a computer (for performing these steps) network.

In response, Applicant has amended claim 14 to recite, in part, "a computer program for scheduling the assignment of variable length data slots in a network system . . ." This amendment clearly discloses implementing a computer.

The above-described claim amendment has been drafted in response to the 35 U.S.C. §101 rejection. The claim amendment has not been drafted to overcome any prior art. In view of the above, Applicant respectfully requests that the Examiner reconsider and withdraw this objection.

Conclusion

Applicant believes that this Response has addressed all items in the Office Action and now places the application in condition for allowance. Accordingly, favorable reconsideration and allowance of claims 1-20 at an early date is solicited. Should any issues remain unresolved, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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Date

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